Avocent®

Direct_PDU

Installer/User Guide

USA Notification

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canadian Notification

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

Safety and EMC Approvals and Markings

RoHS C of C, UL, FCC, cUL, ICES-003, CE, C-Tick

Direct_PDU
Installer/User Guide

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Instructions

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Dangerous Voltage

This symbol is intended to alert the user to the presence of uninsulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

Power On

This symbol indicates the principal on/off switch is in the on position.

Power Off

This symbol indicates the principal on/off switch is in the off position.

Protective Grounding Terminal

This symbol indicates a terminal which must be connected to earth ground prior to making any other connections to the equipment.

TABLE OF CONTENTS

List of Figures ..... **v**

List of Tables ..... **vii**

Chapter 1: Overview and Installation **1**

Features and Benefits *1*

Alarms and monitoring *2*

Sequential power application *2*

Getting Started *2*

Rack Mounting the PDU *3*

Safety Precautions *4*

Safety instructions *4*

Rack mount safety considerations *4*

Chapter 2: On-Board Web Interface **7**

Overview of the PDU's On-Board Web Interface *7*

Control screen *7*

Network screen *8*

ID screen *9*

Email screen *9*

Trap screen *10*

Chapter 3: Direct_PDU Utility Software **11**

Overview of the PDU Utility Software *11*

About The Direct_PDU Utility Software Interface Window *11*

Using The Function Menu Bar *13*

Using the Device menu *13*

Using the Data Management menu *17*

Using the System Management menu *17*

Using PDU Information *22*

Using the Group Information tab *22*

Using the Device Information tab *23*

Using the Data Log tab *26*

Using the Events tab *27*

Appendices 29

Appendix A: Specifications 29

Appendix B: Technical Support 30

LIST OF FIGURES

Figure 1.1: Direct_PDU Unit *1*
Figure 1.2: Direct_PDU Configuration *3*
Figure 2.1: OBWI Index Screen *7*
Figure 2.2: Control Screen *8*
Figure 2.3: Network Screen *9*
Figure 2.4: ID Screen *9*
Figure 2.5: Email Screen *10*
Figure 2.6: Trap Screen *10*
Figure 3.1: Direct_PDU Utility Software Login Screen *11*
Figure 3.2: Direct_PDU Utility Software Interface Window *12*
Figure 3.3: Add Device Screen *13*
Figure 3.4: Device Edit Screen *14*
Figure 3.5: Modify IP Screen *14*
Figure 3.6: Edit PDU Config. Screen *15*
Figure 3.7: Add Group Screen *16*
Figure 3.8: Edit Group Name Screen *16*
Figure 3.9: Scan Domain Screen *18*
Figure 3.10: General Settings Screen *19*
Figure 3.11: User List Screen *20*
Figure 3.12: Add User Screen *20*
Figure 3.13: Edit User Screen *21*
Figure 3.14: Database Setting Screen *21*
Figure 3.15: Service Control Screen *22*
Figure 3.16: Group Information Screen *23*
Figure 3.17: Device Information Screen *24*
Figure 3.18: PDU Information Screen *25*
Figure 3.19: Data Log Screen *26*
Figure 3.20: Events Screen *27*

LIST OF TABLES

Table 1.1: Direct_PDU Features *1*
Table 1.2: Direct_PDU Configuration Descriptions *3*
Table 3.1: Direct_PDU Utility Software Interface Window Area Descriptions *12*
Table 3.2: Device Summary Description *13*
Table A.1: PDU Specifications *29*

CHAPTER 1

Overview and Installation

Features and Benefits

The Avocent Direct_PDU™ power strip is an Internet-ready power strip equipped with an intelligent current meter to indicate the total power consumption of the Power Distribution Unit (PDU). Each PDU includes the Avocent Direct_PDU Utility software to monitor and manage multiple PDUs.

Figure 1.1: Direct_PDU Unit

Table 1.1: Direct_PDU Features

Number	Description
1	Ethernet connection for the built-in web server.
2	An audible alarm that beeps once a second for a warning and three times per second when the PDU is overloaded.
3	A function button that can be used to turn off the warning alarm, change the meter display from current to IP address or reboot the power. Press and release the function button to turn off the warning alarm. Press and hold the function button until it beeps twice to change the meter display. Press and hold the function button until it beeps six times to reboot the PDU.
4	A built-in true Root Meter Square (RMS) current meter. The meter can display either the current or IP address.
5	Outlet LEDs labeled alphabetically to indicate the output power of the PDU. When an outlet's LED is illuminated, the current meter displays that outlet's power.
6	An LED indicator that displays whether the meter is displaying the current or IP address.

Table 1.1: Direct_PDU Features (Continued)

Number	Description
7	Depending on the model, the PDU has either 8 or 16 outlets.
8	A circuit breaker that provides protection during a power overload.

Alarms and monitoring

The PDU delivers accurate, real-time global current monitoring of all connected devices via the on-board web interface or through the Direct_PDU Utility software. Users have the ability to set a current alarm threshold that, once exceeded, will cause the PDU to sound an alarm or send a notification message, or both.

Sequential power application

The PDU incorporates a sequential power application feature that prevents all power outlet receptacles from turning on at once, eliminating the potential of current surges that could render the equipment inoperable. Together with the global current monitoring, the sequential power application feature lets users safely install more equipment on existing power circuits without the worry of current overloads.

Getting Started

Before installing your PDU, refer to the following list to ensure you have all items that shipped with the PDU, as well as other items necessary for proper installation. The standard PDU package includes the following:

- Power Distribution Unit
- Rack mounting brackets
- Four retaining screws for each rack mounting bracket
- Quick Installation Guide to help mount and install a PDU
- CD that contains this document, PDU Utility software and Management Information Base for Network (directpdu.MIB)

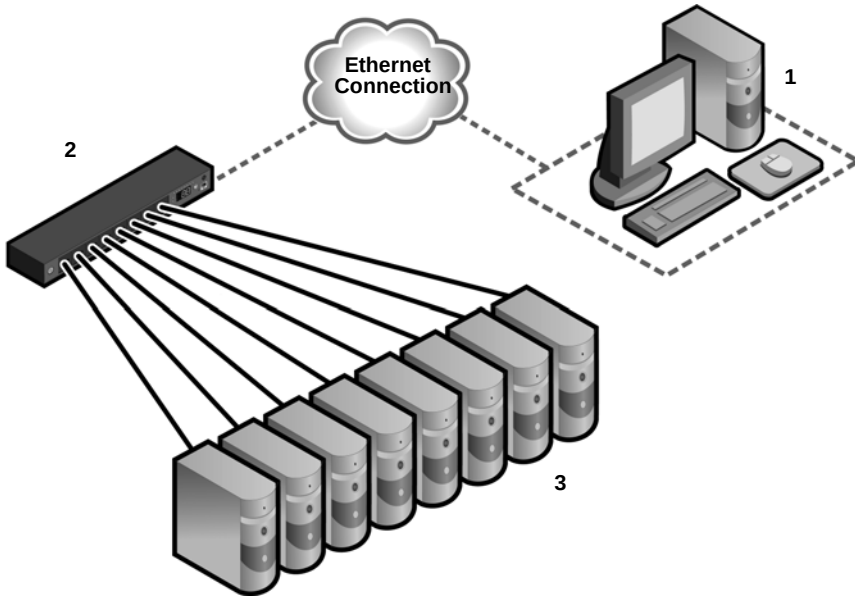

Figure 1.2: Direct_PDU Configuration

Table 1.2: Direct_PDU Configuration Descriptions

Number	Description
1	User station equipped with PDU Utility software
2	PDU
3	Devices plugged into the PDU

Rack Mounting the PDU

You may mount the Direct_PDU power strip in a rack or place it on a desktop or other flat surface. Two brackets are supplied with four retaining screws for each bracket.

To rack mount the PDU:

1. Attach the mounting brackets to the PDU using the four retaining screws provided for each bracket. Align the mounting holes of the brackets with the notched holes on the vertical rail of the rack and attach with the retaining screws.
2. Plug the PDU into an appropriate wall outlet and then plug the devices into the PDU.
3. Connect the Ethernet cable to the PDU.

NOTE: The default IP address of the PDU is 192.168.0.216 if the network does not have a DHCP server.

Safety Precautions

To avoid potential video and/or keyboard problems when using Avocent products:

- If the building has 3-phase AC power, ensure that the server and monitor are on the same phase. For best results, they should be on the same circuit.

To avoid potentially fatal shock hazard and possible damage to equipment, please observe the following precautions:

- Do not use a 2-wire extension cord in any Avocent product configuration.
- Test AC outlets at the server and monitor for proper polarity and grounding.

Safety instructions

Read all the following safety guidelines to protect yourself and your PDU.

WARNING: All outlets of the PDU output high voltage. Necessary precautions should be taken.

WARNING: Do not push any objects through the openings of the PDU. Doing so may cause fire or electric shock by shorting out interior components.

WARNING: There is a possibility of severe electrical shock from either the live or neutral side of any of the power outlets or their wiring, even if one of the circuit breakers is disabled.

WARNING: The PDU is intended for indoor use only.

WARNING: To help protect the PDU from electrical power fluctuations, use a surge suppressor, line conditioner or uninterruptible power supply.

WARNING: Be sure that nothing rests on the cables of the PDU and that it is not located where it may be stepped on or tripped over.

WARNING: Do not spill food or liquids on the PDU. If it gets wet, disconnect the power immediately and contact Avocent.

WARNING: Keep the PDU away from heat sources.

Rack mount safety considerations

When installing the PDU, make sure the following environmental specifications are met:

Elevated Operating Ambient Temperature: If the PDU is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer’s maximum rated ambient temperature. See above.

Reduced Air Flow: Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

Mechanical Loading: Mounting of the equipment in the rack should be such that a hazardous condition is not created due to uneven mechanical loading.

Circuit Overloading: Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Grounding: Reliable grounding of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit, such as power strips or extension cords.

CHAPTER 2

On-Board Web Interface

Overview of the PDU's On-Board Web Interface

The Direct_PDU power strip has an on-board web interface (OBWI) to monitor and manage the PDU. Using the OBWI, you can view the PDU's system information, threshold and status. You can also monitor power consumption and control individual outlets on the PDU, configure network settings and set up email and trap notifications.

To access the OBWI:

In the address field of the Windows® browser, type the IP address of the PDU. The Index screen opens, displaying information about the PDU. Links are available at the bottom of the Index screen to access other OBWI screens. These links are also available at the bottom of each OBWI screen.

NOTE: The PDU's default IP address is 192.168.0.216 if the network does not have a DHCP server.

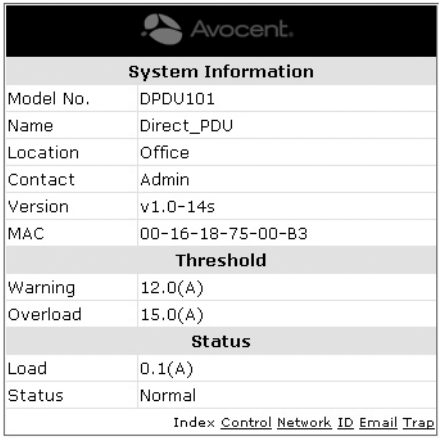

Figure 2.1: OBWI Index Screen

Control screen

The Control screen of the OBWI displays the PDU's power consumption and status. It also displays and allows you to control the status of the PDU's individual outlets.

To turn outlets on or off from the Control screen:

1. Click on the *Control* link at the bottom of the screen. The Control screen opens.
2. Check the box next to the outlet you want to turn on or off.
3. Enter the user ID and password in the appropriate fields.

NOTE: The default ID is **snmp** and the default password is **1234** for all screens.

4. Select either the *On* or *Off* button at the bottom of the screen. The status of the outlets you selected will change.

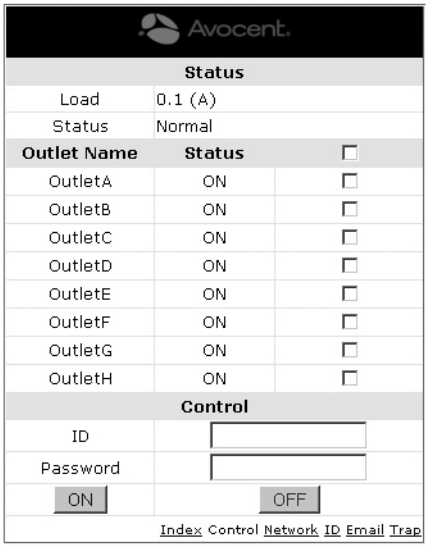

Figure 2.2: Control Screen

Network screen

Using the Network screen of the OBWI, you can view and configure network information for the PDU.

To change network information for the PDU:

1. Click on the *Network* link at the bottom of the screen. The Network screen opens.
2. Make changes in the appropriate fields.
3. Click the *Update* button.

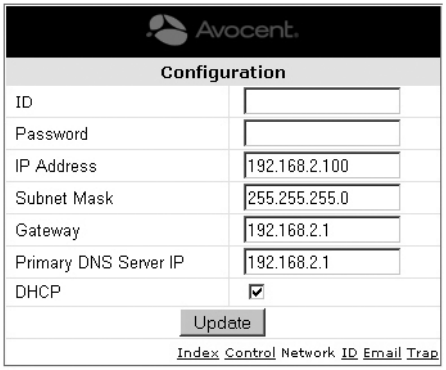

Figure 2.3: Network Screen

ID screen

Using the ID screen of the OBWI, you can change the user ID and password for the PDU.

To change the user ID and password:

1. Click on the *ID* link at the bottom of the screen. The ID screen opens.
2. Enter the original ID and password and new ID and password in the appropriate fields.
3. Click the *Update* button.

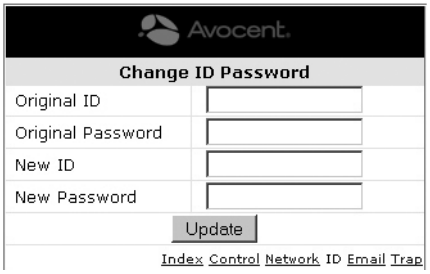

Figure 2.4: ID Screen

Email screen

When a user-defined event occurs, the PDU Utility software can send an email notification. You can configure where to send the email notification in the OBWI. You can configure the event using the PDU Utility software. For more information on configuring the event, see *To edit PDU configuration:* on page 15.

To configure an email notification:

1. Click on the *Email* link at the bottom of the screen. The Email screen opens.
2. Enter the email information in the appropriate fields.

3. Click the *Apply* button.

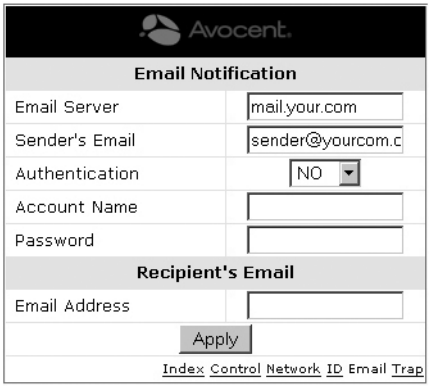

Figure 2.5: Email Screen

Trap screen

When a user-defined event occurs, the PDU Utility software can send a trap notification. You can configure where to send the trap notification in the OBWI. You can configure the event using the PDU Utility software. For more information on configuring the event, see *To edit PDU configuration:* on page 15.

To configure a trap notification:

1. Click on the *Trap* link at the bottom of the screen. The Trap Screen opens.
2. Enter your ID, password and receiver IP in the appropriate fields.
3. Click the *Update* button.

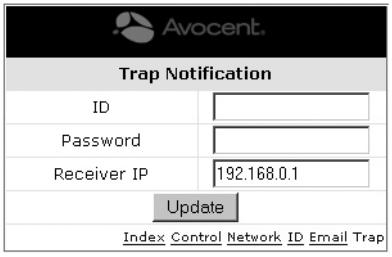

Figure 2.6: Trap Screen

CHAPTER 3

Direct_PDU Utility Software

Overview of the PDU Utility Software

The Direct_PDU Utility is advanced PDU monitoring and management software. With the Direct_PDU Utility software you can monitor groups of PDUs simultaneously, provide a power consumption chart for daily, monthly or a user-defined period, send email and trap information to a specific account and log and export events to a Syslog server.

To access the PDU Utility software:

1. From the Windows Start menu, select *Programs* and then the Direct_PDU Utility software. The login screen opens for the Direct_PDU Utility software.
2. Enter your username and password.

NOTE: The default username is **admin** and the default password is **1234**.

3. Click *OK*. The PDU Utility software interface window opens.

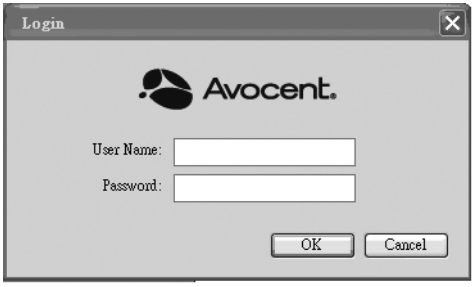

Figure 3.1: Direct_PDU Utility Software Login Screen

About The Direct_PDU Utility Software Interface Window

When a user logs in and has been authenticated, the Direct_PDU Utility software interface window appears. From this window, a user can monitor and manage multiple PDUs.

Figure 3.2 shows the areas of the Direct_PDU Utility interface window.

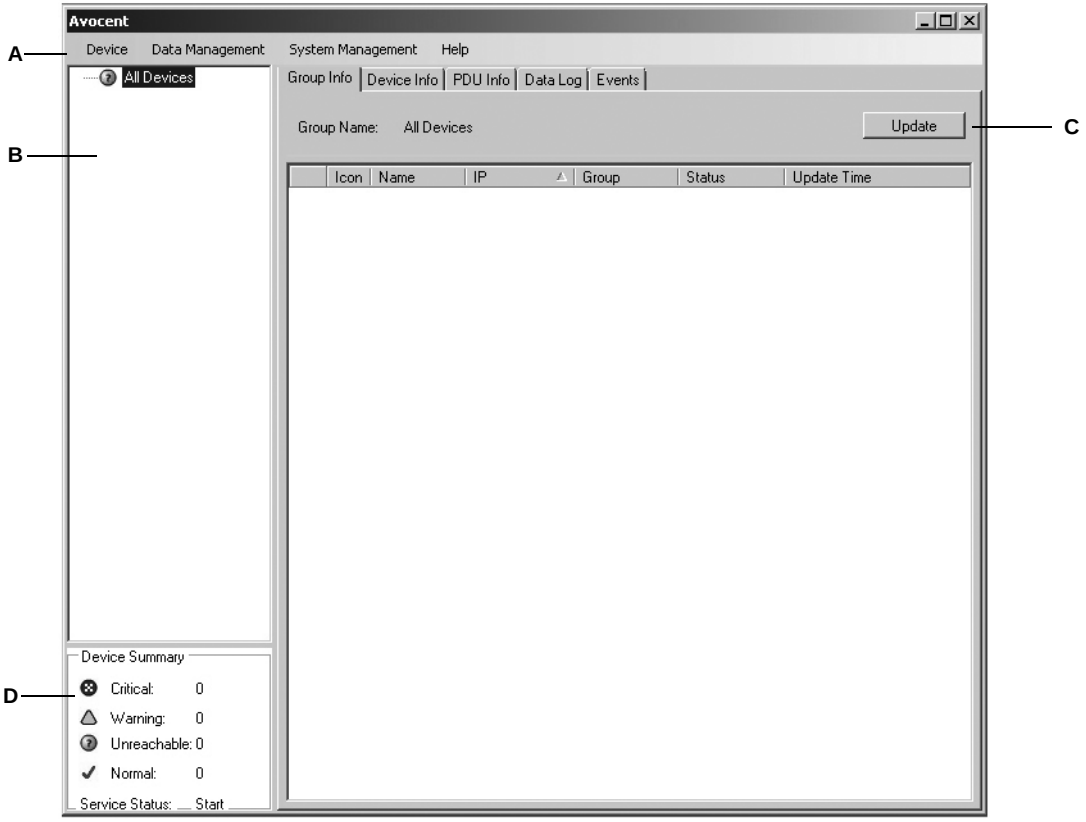

Figure 3.2: Direct_PDU Utility Software Interface Window

Table 3.1: Direct_PDU Utility Software Interface Window Area Descriptions

Letter	Description
A	Function Menu Bar - Use the Function Menu Bar to access the Device, Data Management, System Management or Help menus.
B	PDU List - Lists all of the PDUs and associated outlets connected to the network. Users can define a group to manage the PDUs.
C	PDU Information - This area provides detailed information about each PDU connected to the network.
D	Device Summary - Shows the status of the PDUs and associated outlets connected to the network.

Table 3.2 shows the meaning of the icons in the Device Summary field:

Table 3.2: Device Summary Description

Icon	Status
Critical	Output power of the PDU exceeds the overload setting.
Warning	Output power of the PDU exceeds the warning setting.
Unreachable	The PDU Utility can not communicate with the PDU.
Normal	The PDU is working normally.

Using The Function Menu Bar

Using the Device menu

Using the Device menu you can add, edit and remove both individual devices or groups of devices connected to the PDU.

To add a device:

1. From the Function Menu Bar, click *Device-Add Device*. The Add Device screen opens.
2. Specify the settings for the device to be added in the appropriate fields.
3. Click *OK*.

NOTE: The Community field must be the same - private or public - as the PDU in order for the PDU Utility software to communicate with the PDU. The default setting is private.

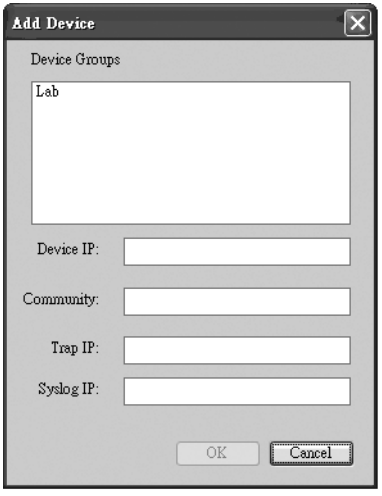

Figure 3.3: Add Device Screen

To edit a device:

1. Highlight the device to edit in the PDU List from the Direct_PDU Utility software interface window.
2. From the Function Menu Bar, click *Device-Edit Device*. The Device Edit screen opens.
3. Specify the changes for the device in the appropriate fields.
4. To change the method the Direct_PDU Utility software uses to obtain the IP address, click in the IP Address field then click *Modify* in the Network Settings field.
5. The Modify IP screen opens. Specify the changes in the appropriate fields and click *OK*.

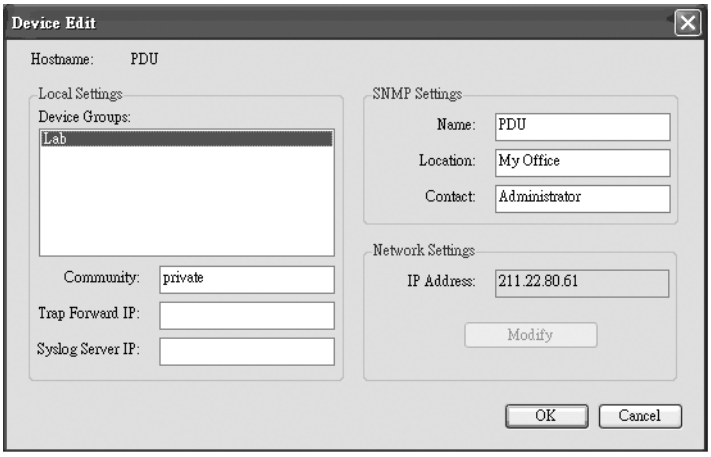

Figure 3.4: Device Edit Screen

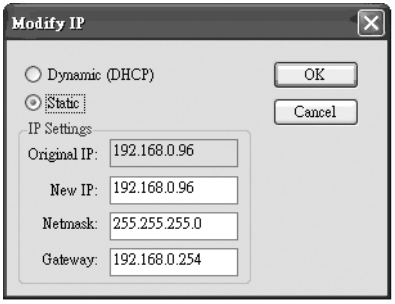

Figure 3.5: Modify IP Screen

To remove a device:

1. Highlight the device to be removed in the PDU List from the Direct_PDU Utility software interface window.
2. From the Function Menu Bar, click *Device-Remove Selected Device*. The Device Delete Confirmation screen opens.

3. Click *Yes* to remove the device. A Record Delete Confirmation screen opens.
4. Click *Yes* to delete the record.

   -or-

   Click *No* to keep the record.

To edit PDU configuration:

1. Highlight the PDU to be edited in the PDU List from the Direct_PDU Utility software interface window.
2. From the Function Menu Bar, click *Device-Edit PDU Config*. The Edit PDU Config. screen opens.
3. A user can configure the PDU's voltage settings, threshold settings and outlet name settings from this screen. Set the values in the appropriate fields and click *OK*.

NOTE: The minimum warning current value is .6 amp.

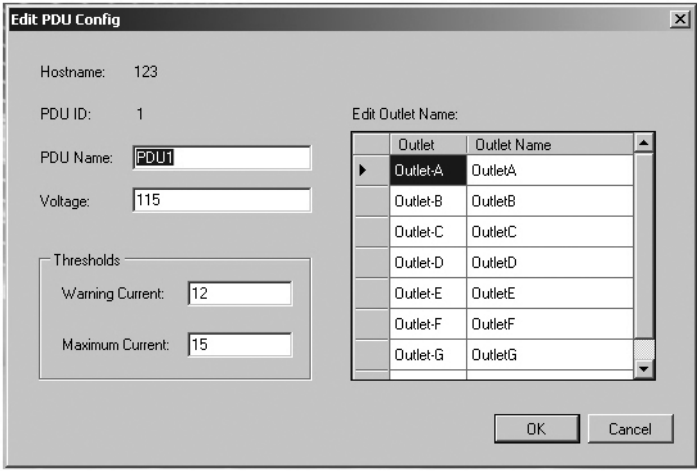

Figure 3.6: Edit PDU Config. Screen

To update device information:

1. Highlight the device in the PDU List from the Direct_PDU Utility software interface window.
2. From the Function Menu Bar, click *Device-Update Device Information*. A screen opens notifying you device information will be updated shortly.

To remove a PDU:

1. Highlight the PDU to be removed in the PDU List from the Direct_PDU Utility software interface window.

2. From the Function Menu Bar, click *Device-Remove Selected PDU*. A screen opens to confirm the deletion. Click *Yes*.

To add a device group:

1. From the Function Menu Bar, click *Device-Add Device Group*. The Add Group screen opens.
2. Enter the group name and click *OK*.

Figure 3.7: Add Group Screen

To edit a group:

1. Highlight the group in the PDU List from the Direct_PDU Utility software interface window.
2. From the Function Menu Bar, click *Device-Edit Group*. The Edit Group screen opens displaying the original group name with a field for the new group name.
3. Enter the new group name. Click *OK*.

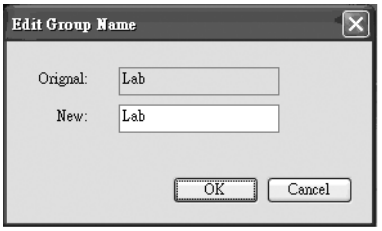

Figure 3.8: Edit Group Name Screen

To remove a group:

1. Highlight the group to be removed in the PDU List from the Direct_PDU Utility software interface window.
2. From the Function Menu Bar, click *Device-Remove Device Group*. The Group Delete Confirmation screen opens.
3. Click *Yes* to remove the group. A Group Delete Confirmation screen opens.
4. Click *Yes* to delete the group.

   -or-

   Click *No* to keep the group.

NOTE: All devices must be removed individually from the group before the entire group can be removed.

Using the Data Management menu

Users can export and remove current accounting data, event logs and power consumption data from the Function Menu Bar by clicking *Data Management* and then making the appropriate selection. Current accounting data and event logs are exported in CSV format.

To export current data:

1. Highlight the device with the accounting or events to export in the PDU List from the Direct_PDU Utility software interface window.
2. From the Function Menu Bar, click *Data Management-Export kW*hr Account to CSV* to export current accounting. A save-as screen opens.

   -or-

   From the Function Menu Bar, click *Data Management-Export Data Log to CSV* to export current data. A save-as screen opens.

   -or-

   From the Function Menu Bar, click *Data Management-Export Events to CSV* to export events. A save-as screen opens.
3. Select where you want to save the file, type a filename in the filename field and select *Save*.

To remove current data:

1. Highlight the device with the accounting or events to be removed in the PDU List from the Direct_PDU Utility software interface window.
2. From the Function Menu Bar, click *Data Management-Remove kW*hr Account Records* to remove current accounting records.

   -or-

   From the Function Menu Bar, click *Data Management-Remove Data Log Records* to remove current data.

   -or-

   From the Function Menu Bar, click *Data Management-Remove Event Records* to remove power consumption records.
3. A confirmation screen opens. Select *OK*.

Using the System Management menu

Use the System Management menu to scan for devices, set general settings, manage users, set database settings and control services.

To scan a subnet:

1. From the Function Menu Bar, click *System Management-Scan Subnet*. The Scan Domain screen opens. You can:
   a. Check *Scan network interface subnet* by making the appropriate selection.

   -or-

   b. Check *Scan the specified subnet* and type in the IP address obtained from the PDU.
2. Click *Scan*.

NOTE: The PDU will show the assigned IP address by pressing the **Function** button until the PDU beeps twice.

3. Check the *Add* field next to the device to be added.
4. In the Device Groups field, select a group for the device.
5. Click *OK*.

NOTE: It may be necessary to scan more than once to get all of the IP addresses in the network.

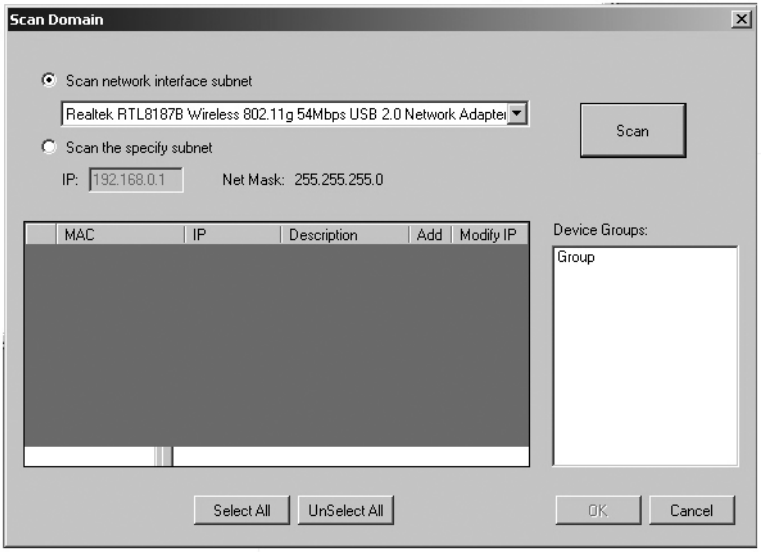

Figure 3.9: Scan Domain Screen

Using the General Settings option

When a threshold has been exceeded, the PDU Utility software can send an email to as many as three user-defined accounts. The PDU Utility software can send an event email for any of the PDUs connected to the network.

To configure email settings:

1. From the Function Menu Bar, click *System Management-General Settings.* The General Settings screen opens.
2. Check the box next to *Enable* to enable an email alert. Enter the appropriate information in the fields. You can send email alerts to as many as three email addresses.
3. Click *OK*.

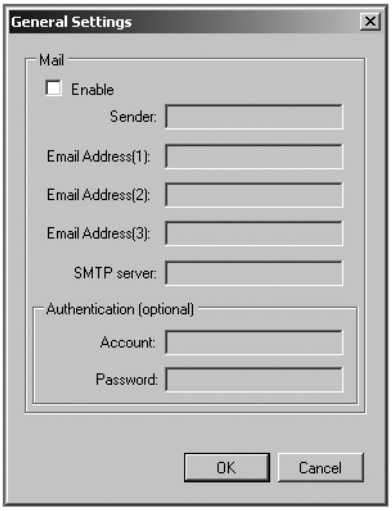

Figure 3.10: General Settings Screen

Using the Users Lists option

To add a user:

1. From the Function Menu Bar, click *System Management-User List*. The User List screen will open.
2. Click *Add User.* The Add User screen opens.
3. Enter the username and password for the new user.
4. Assign Read Only or Read/Write authority.
5. Click *OK*.

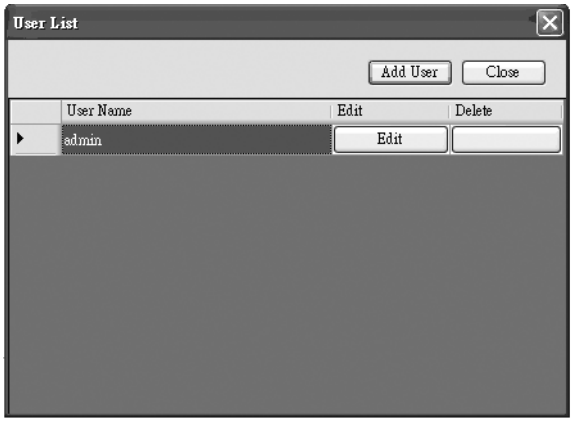

Figure 3.11: User List Screen

Figure 3.12: Add User Screen

To edit a user:

1. From the Function Menu Bar, click *System Management-User List*. The User List screen will open.
2. Click the *Edit* button next to the name of the user to edit. The Edit User screen opens.
3. Make changes and click *OK*.

NOTE: A user can only change the password for the Admin account.

Figure 3.13: Edit User Screen

To use the database setting option:

1. From the Function Menu Bar, click *System Management-Database Setting*. The Database Setting screen will open.
2. Select either *Microsoft Access* or *MySQL* and make changes in the appropriate fields.
3. Click *OK*.

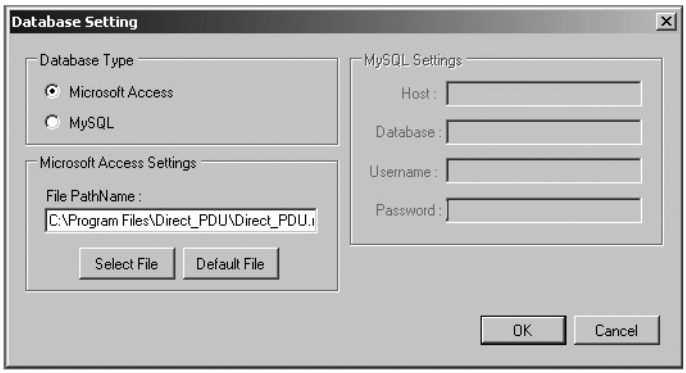

Figure 3.14: Database Setting Screen

To use the service control option:

1. From the Function Menu Bar, click *System Management-Service Control*. The Service Control screen will open.
2. Control the service status by selecting either *Start*, *Stop* or *Restart*.
3. Click *OK*.

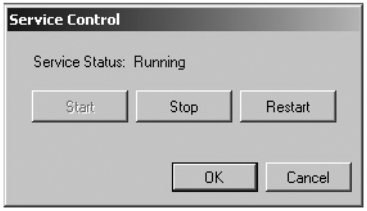

Figure 3.15: Service Control Screen

Using PDU Information

Using the Group Information tab

From the Group Information tab, a user can monitor all the Direct_PDU power strips in the network. Each PDU is listed under the Group Information tab along with its status. Each PDU's status is one of the following:

- Normal - The PDU Utility software is communicating normally with the PDU.
- Querying - The PDU Utility software is requesting data from the PDU.
- Communication Lost - The PDU Utility software can not receive data from the PDU.
- Warning - The power consumption of the PDU exceeds the warning threshold.
- Overload - The power consumption of the PDU exceeds the overload threshold.

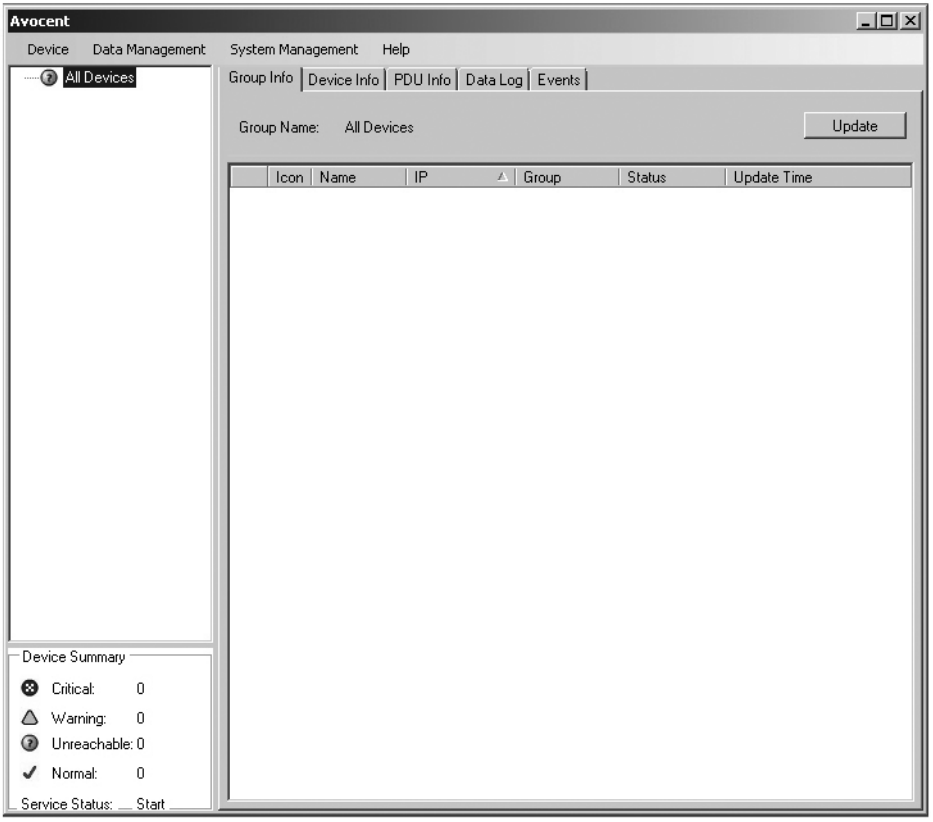

Figure 3.16: Group Information Screen

Using the Device Information tab

By clicking on a device in the PDU List from the Direct_PDU Utility software interface window then clicking the Device Information tab, a user can see information on an individual device.

To update device information:

1. Click on *IP Address* under Network Information.
2. Click *Update* to get an update on device information.

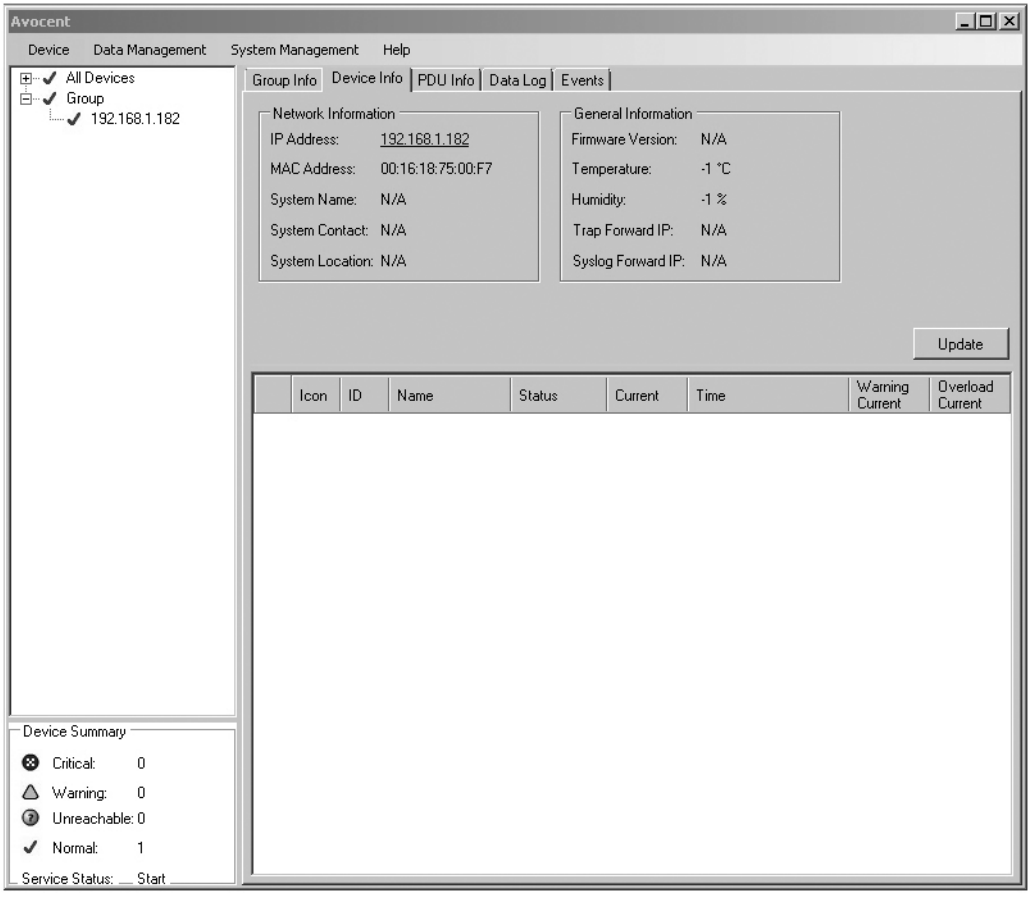

Figure 3.17: Device Information Screen

Using the PDU Information tab

To monitor power consumption:

1. From the PDU List, highlight the PDU to monitor.
2. Click on the *PDU Info* tab.
3. Check *Daily, Monthly* or *Custom*, then select the date, month or custom time frame in the appropriate field.
4. Click *Update*.

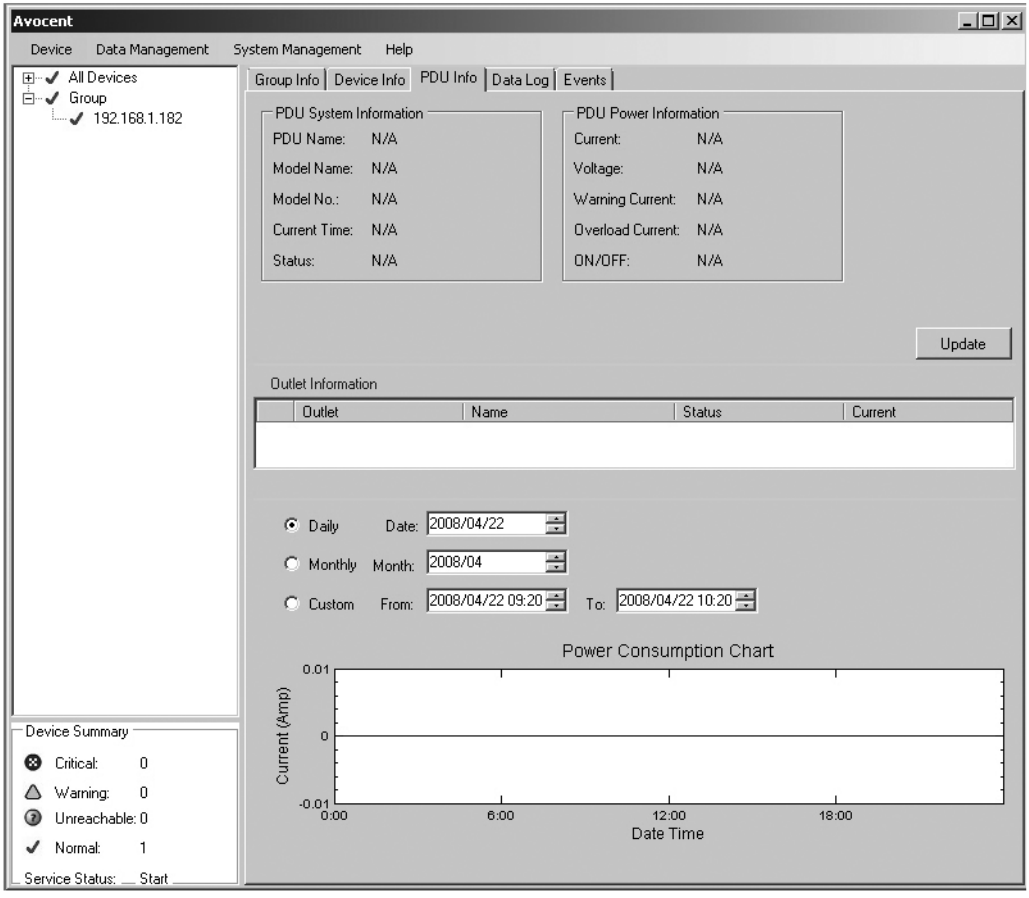

Figure 3.18: PDU Information Screen

Using the Data Log tab

Click on the *Data Log* tab to see details of the PDU's power consumption. You can select options to see power consumption by month or by a custom range.

To see details of the PDU's power consumption:

1. From the PDU List, highlight the PDU to monitor.
2. Click on the *Data Log* tab.
3. Select either *Current* or *Power* under Log Type.
4. Choose to see power consumption by month or a custom range.
5. Click *Update*.

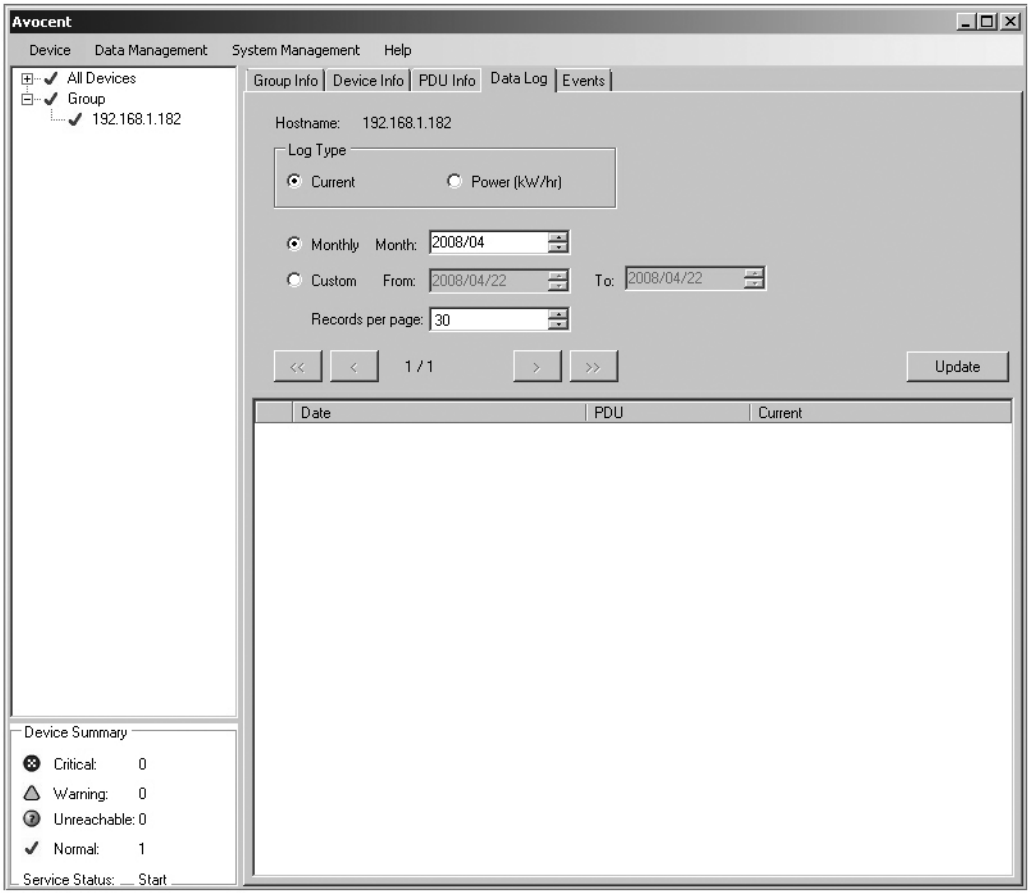

Figure 3.19: Data Log Screen

Using the Events tab

The Events tab shows a list of PDU events.

To see a list of all PDU events:

1. Click on the *Events* tab.
2. Choose to see events by month or a custom range.
3. Click *Update*.

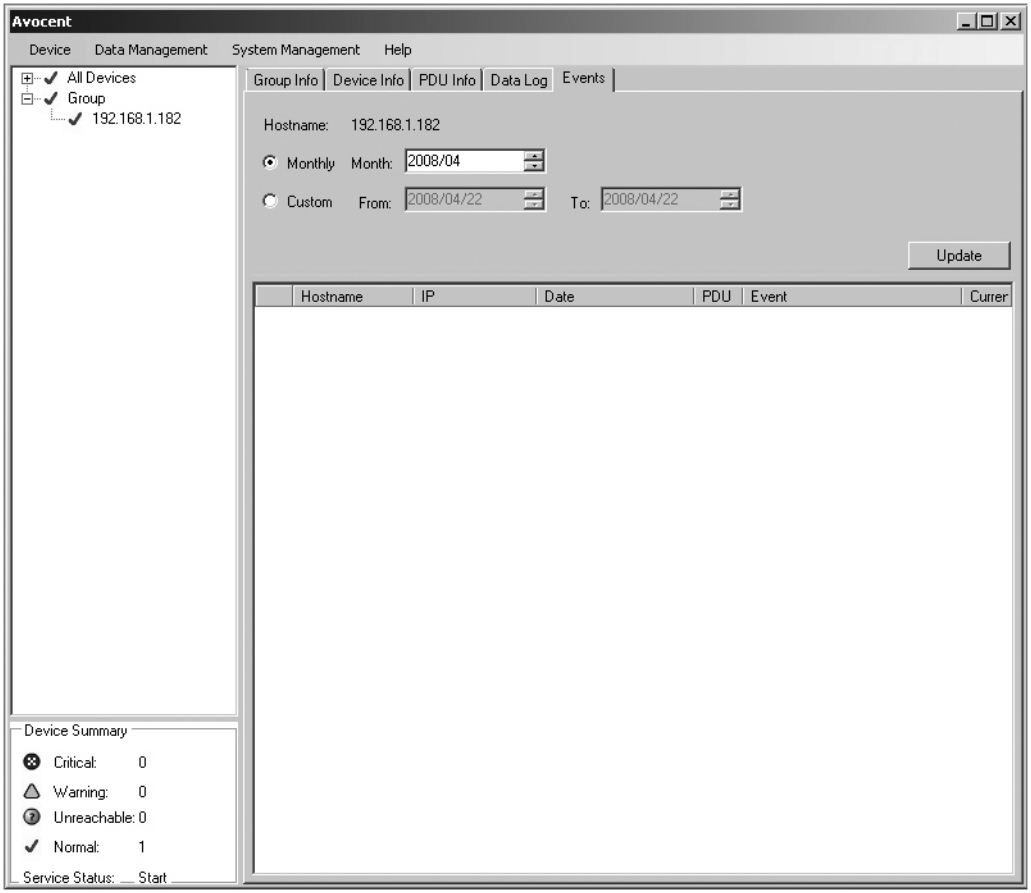

Figure 3.20: Events Screen

APPENDICES

Appendix A: Specifications

Table A.1: PDU Specifications

Interface	
RJ-45	Ethernet
Nominal Input Frequency	47-63 Hz Full Range
LED Indicator	
Indicator	one yellow LED, one red LED
Current Meter	three digits
Range	0AMP-20AMP (True RMS)
Resolution	0A-20A: .1A
Precision	0A-20A: +/-2%+/-0.1AMP
Alarm	
Audible	Warning - one beep in one second; Overload - three beeps in one second
Seven Segment	Warning and Overload - Meter will flash once in one second
Operation and Environment	
Operating Temperature	23 to 113 degrees Fahrenheit (-5 to 45 degrees Celsius)
Relative Humidity	0 to 95 percent
Storage Temperature	-13 to 149 degrees Fahrenheit (-25 to 65 degrees Celsius)
Safety and EMC Approvals and Markings	
	RoHS C of C, UL, FCC, cUL, ICES-003, CE, C-Tick Safety certifications and EMC certifications for this product are obtained under one or more of the following designations: CMN (Certification Model Number), MPN (Manufacturer's Part Number) or Sales Level Model designation. The designation that is referenced in the EMC and/or safety reports and certificates are printed on the label applied to this product.

Appendix B: Technical Support

Our Technical Support staff is ready to assist you with any installation or operating issues you encounter with your Avocent product. If an issue should develop, follow the steps below for the fastest possible service.

To resolve an issue:

1. Check the pertinent section of this manual to see if the issue can be resolved by following the procedures outlined.
2. Visit www.avocent.com/support and use one of the following resources:

   Search the knowledge base or use the online service request.
   -or-
   Select *Technical Support Contacts* to find the Avocent Technical Support location nearest you.

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For Technical Support:

www.avocent.com/support

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